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Beggs ~~Kolm-Gen.~~

Thank you very much, DR, ~~Singman~~ Lemon, Dr. Kolm, ladies and gentlemen, I'm delighted to be here and particularly delighted to share your tribute to Waldo ~~Freeman~~ Lemon, one of the most distinguished and productive inventors of our age. It is also an honor to share this platform with Dr. Kolm whose mass driver concept was essential to the development of space and the exploitation thereof as was the steam engine in the development of this nation and the world.

Lawyers are some of my favorite people. As a matter of fact, I'm giving you my middle daughter who is about to finish up and come to work right here in New York. Life I think has treated you unfairly. You wrestle day after day with problems of humanity under duress but your profession has been castigated just because you do that. There is even a line in the New Testament from Luke which says, "Woe unto you lawyers f or you ~~dave~~ lade men with burdens grievous to bear."

But I'm here to tell you that the patent lawyers do not do that and I'm proud of you. I'm also proud of the fact that we are in Washington these days wrestling with the new patent policy which we hope will free up what has been the dead hand of the federal bureaucracy on patent policy and allowing the many benefits that flow out of the space programs and the other R&D programs in the government to be exploited and to become economically viable without requiring all of the multitudinous, very difficult procedures with the federal bureaucracy has placed upon that process in the past.

If I may, I'd like to talk to you today about maybe

three things, which is a lot with our rather short time and I will try to be brief, I'd like to talk about the space program and where we're going today, what we have done inthe past, and continue to do in the future onresearch and development both in aeronautics and space and research and what we intend to do or what we intend to try to do for the future in advancing this conntry into the 21st century.

Dr. Lemon's life has spanned what has been perhaps the greatest span of technological achievement in the history of the world. We've moved in his lifetime from horse drawn vehicles to an aerospace shuttle and indeed the exploration of the outer planets. Voyager II brought back to us the visions of primordial planetary development which was unknown just a few years ago. Equally important were the technological fallouts that came from that exploration activity.

As we look back o nthe short lifetime of my agency which goes back just a little over two decades, we have come frm an aeronautical base into an era where we're flying a vehicle which will give us routine access to lower earth orbit and then later on to a geosynchronous and lunar orbit which will enable us to do things which were only dreamed of just a scant deacde or two ago. Moreover, the technology that we have developed in doing that exploration and doing that very new innovation has resulted in very important fallout to the national economy. Indeed, you can make a string argument for the technological frontier that we have been investigating in the last 20 or 30 years, has improved the productivity of our nation and has been a very important element in the progress we have made toward a fuller life and a

more productive economy.

And I think it's important to remember that at a time when we're sort of going back and re-examining how we go about doing things inthe federal structure, That what we have done in the aeronautics and space program of NASA and its predecessor agency, the National Advisory Committee for Aeronautics which goes back to 1915, has been a very, very productive partnership between the federal government, the university community and our industry. We've worked very closely together with them and the result is obvious. We lead the world in aeronautics, we lead the world in space. We are being copied around the world in the way we have done that and indeed, the rest of the world is very envious of the fact that we have a mechanism in place and they're trying to duplicate it.

NOw where are we going? Well, in April we flew the shuttle and we proved its concept is sound. It will work as advertised. What are we going to do with it? We're going to do much what we did in the last few decades and we're going to grow from that. We're going to try to take some quantum jumps and I'll go through a small scenario of what we might do, but it opens a brand new era for us which is only restricted by the inventiveness and innovation of our pepole.

We have the capability now of launching very large payloads into lower earth orbit. We are capable now of picking them up, of checking them out on orbit, of repairing them in orbit, and if necessary of bringing them back and repairing them on earth and then flying them again. For the very expensive payloads we are talking about that is indeed a very impressive

capability, one that exists no where in the world but here.

The shuttle which will start flying commercial payloads next year is a system which will enable us to do a lot of new things. But is is only an enabling mechanism. It's not a VRC??? in and of itself. It's nothing except an enabling mechanism. We must decide how to use it.

I went back and re-read some thoughts that Tom Paine who was one of the most innovative and perhaps one the thinkers of the space program, the best thinker we had in the space program as an administrator, and Tom, as you know has been out in California as president of the Northrup Corporation, wrote down a few years ago a scenario. He said first of all let's get the space shuttle, Then let's put into orbit the Spacelab and build around it a space station. And as we learn how to use that space station, in lower earth orbit, then learn how to tug it out or move it out to a geosynchronous orbit and finally move into lunar orbit. And as we enter the 21st century in about the year 2000 or shortly thereafter, we will have established a space station manned and capable of doing a number of different things which cannot only yield benefits for the earth but can we can start thinking about exporting the moon's resources.

Out about the year 2010 or so, we could concieve of establishing a colony on the moon, starting with a small research station. Then with robots which as you know we're pursuing very much on earth, we might establish a productive activity on the moon, and finally by maybe 2020 or 2030, we might indeed have an operating productive enterprise going on the moon. By that time we would have thought about the possibility of also exploiting

Mars and by that time robots, but not only robots but self-replicating robots will enable us to start to construct a station with robots on Mars.

And I must just say incidentally that my friend Tom Paine may have been a bit short onthat because in Japan today, mind you Japan, there is a factory run by robots producing other robots. In about the year 2040, the colony on the moon would be flourishing and 2o short years after that, the colony on Mars could be flourishing and with my friend Dr. Kolm's mass driver, we could be sending down vast amounts of material to help us exploit and allowing those colonies to reach economic self sufficiency.

Is that an impossible dream? No, the technology for that is in our hands today. It all exists. All we have to do is have the will and the purpose to exploit it. And I might say it requires a little faith. H.L. Mencken, who is one of my favorites, and since I spent some time in Baltimore, I got to read quite a lot of Mr. Mencken, once described faith and he said faith may be defined briefly an an illogical belief in the occurrence of the improbable. Think about it. That indeed is perhaps what we need today.

All those within our society ~~in our society~~ who believe that interplanetary-space or even interplanetary colonization is impossible only knew a little faith because if you look back as far as Dr. ~~Seaman~~ Seamon looks, I'm sure many of the things that are happening today required a great deal of faith when he was just growing up. What we have done in the last two decades has been amazing. What we can do in the next two decades is only envisinned in man's dreams.

If I may, I'd like to leave one other thought with you today and that has to do with what I began with which is the interaction of the federal structure with the private sector and the university community.

Since 1915 we have conducted in NACA and NASA a program of aeronautics. If you go back 60 years ago and examine the origins of the agency, you will find that this country was terribly disturbed because we could not develop a really first rate military aircraft. And so we established NACA and we established the national series of facilities in order to enable aeronautical research to go forward. And inthe 67 years that we have been pursuing that we have gradually become more competent until the point right before fortunately World War II, we were able to design the most efficient, effective aircraft in the world and we have proceeded from that to the point that today we dominate the world in aeronautics to a degree that the rest of the world is not only envious, but they take great measures to try to hold us down.

Up until a few years ago, we sold 90% of the jet transports in the world. That has resulted from the very close partnership that has existed over that 67 years span between the federal government, the academic community, and the industry. I think it's important to keep that in mind. At the same time, it's also important to keep in mind that foreignors have studied our experiments and our experience and they are coming with duplicates of it and they're going to compete not only in aeronautics but they have extended aeronautics into space. We no longer have a monopoly in the world, either in aeronautics development or in

the apace field.

The French now arein operation with a launch vehicle called the Orion which they are selling all over the world, and I might add they're selling it very cheaply and it is of concern to us. On the other side of the globe, the Japanese have developed a double sized vehicle known as the M-1 and while there is currently an agreement that they will not market that in competition in the rest of the world, you can be sure that in a very short time, the Japanese will come with a commercial design which will compete with us in size of payload.

I would also remind you that the Soviets who have equivalent capability to our own have over the years been offering launch services and they always price it 5% below us. They don't get too many because their penchant for secrecy tends to make people run away from them but they do get enough so that if we lose our thrust, if we ever lose our desire to compete in this arena, you can be sure that the French, the Japanese, the Soviets or even the Chinese, the Peoples' Republic who are also communist, will be ready to take over our market.

We stand on the verge, I believe, of a magnificent period of years. The next 20 years could be absolutely splendid. The coverage of the Voyager flybys thrilled me. Voyager I and Voyager II as it flew by Jupiter and then the most impressive body in our planetary system, Saturn, which is immense. We have more foreign friends credited to that flyby than we had in any space mission in the history of the agency including the Apollo mission. In short, foreigners tend to take more interest in it than the Americans although I must say the Americans are beginning to come

back to the program. We have more interest in the program in the last year or two than we have had in a long, long time. Indeed if you believe the polls, over 60% of the American public who might consider my stockholders, now believe that the space program and the money invested in it is an important part of the American economy and is an important thing to continue.

And perhaps this is what columist George Will had in mind when he wrote recently, and he thrilled me when he did. George is one of my favorite people. He said we know next to nothing about virtually everything. It is not necessary to know the origin of the universe. It is o nly necessary to want to know. Civilization depends not on any particular knowledge but on the dispositioin to crave knowledge. And indeed, it's the hallmark of a great nation to want to continue to explore the unknown and that's what we're all up to in the program we're conducting. And it's my view that this great nation will continue that exploration for a long, long time in the future and if we do, we'll continue to prosper. Thank you very much.